PB-216 463

MEMORANDUM ON SECOND CONFERENCE IN GRAND FORKS, NORTH DAKOTA WITH HEALTH OFFICIALS RELATIVE TO THE STREAM POLLUTION INVESTIGATION OF THE RED RIVER OF THE NORTH.

Public Health Service
Cincinnati, Ohio

30 January 1939

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PB 216 463

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MEMORANDUM ON SECOND CONFERENCE IN GRAND FORKS, N. D.
WITH HEALTH OFFICIALS RELATIVE TO THE STREAM POLLUTION INVESTIGATION
OF THE RED RIVER OF THE NORTH

In accordance with official orders, the writer proceeded to Grand Forks, N. D., arriving there January 30, 1939, for the purpose of attending the conference regarding the stream pollution survey of the Red River of the North. The conference was attended by representatives of the Health Departments of the States of Minnesota and North Dakota, of the Dominion of Canada and of the Province of Manitoba. The following men representing the various Health Departments were present:

United States

Minnesota Board of Health:

H. A. Whittaker, Director, Division of Sanitation, Minneapolis, Minnesota.

H. G. Rogers, Sanitary Engineer, Division of Sanitation, Minneapolis, Minnesota.

North Dakota Board of Health:

M. D. Hollis, Sanitary Engineer, Bismarck, N. D.
L. K. Clark, Asst. Sanitary Engineer, Bismarck, N. D.
H. G. Hanson, Asst. Sanitary Engineer, Bismarck, N. D.
J. Svore, Field Engineer, Grand Forks, N. D.
G. Groff, Sanitary Chemist, Grand Forks, N. D.

North Dakota Water Conservation Commission:

Henry Holt, Vice-Chairman, Grand Forks, N. D.
E. J. Thomas, State Engineer, Bismarck, N. D.

Details of illustrations in
this document may be better
studied on microfiche.

Canada

Dominion Department of Pensions and National Health:

F. M. Brickenden, District Sanitary Engineer,
Winnepeg.

Province of Manitoba:

C. H. Attwood, Director of Water Resources,
Department of Mines and Resources,
Winnepeg.

John Foggie, Chief Sanitary Inspector,
Department of Public Health,
Winnepeg.

The meeting was held at the Ryan Hotel and called to order by Mr. Hollis who reviewed the results of former studies, the history and purpose of the present joint study by the Minnesota and North Dakota Boards of Health, the plan followed in the study; and very briefly the results obtained to the present. As the results obtained during the winter season have indicated no appreciable diminution of the biochemical oxygen demand and the complete absence of dissolved oxygen in the stream to the point of entry into Canada from the United States, the desirability of a joint study was apparent to all those present.

The Manitoba representatives were of the opinion that while the immediate study of the stream in Manitoba was desirable, it very likely would be impossible to obtain funds for the study without considerable delay. Various phases of a joint study were discussed, such as the location of sampling stations,

the collection of hydrometric data, the laboratory methods employed and the necessity for the use of the same methods and technique in different laboratories to obtain comparable data in a joint survey.

In the afternoon an informal meeting was held at the North Dakota Stream Pollution Laboratory at the University of North Dakota at Grand Forks and all of the representatives had an opportunity to see the laboratory, the sample collecting and laboratory equipment and the methods employed. The group was taken to a coulee nearby and shown how the samples for the biochemical oxygen demand determination at 0°C. were being incubated under the ice (See photographs attached).

Following this the writer returned to the laboratory with Mr. Hanson, Mr. Svore and Mr. Groff to discuss the results and the difficulties that had been encountered in the work to the present time. The laboratory procedures recommended by the writer in an earlier memorandum (November, 1938) had been adopted and were being very carefully followed. Difficulties with the dilution water had been noted in determining the B.O.D. of the beet sugar plant waste. An examination indicated that a small amount of copper was present in the distilled water due to the tank in which the water was stored after distillation. The difficulty was removed by receiving the water in glass carboys.

However, this meeting brought out the fact that Grand Forks water receives chloramine treatment and that no precaution had been taken to remove any possible residual chloramine before or after distillation. It was recommended, therefore, that an activated carbon filter be installed on the city water line ahead of the laboratory still to insure the removal of chloramine. Until the carbon filter can be installed, all distilled water used in the preparation of dilution water should be tested to determine the amount of residual chloramine present and the calculated amount of an N/10 sodium sulphite solution necessary to neutralize this should be added.

The practice of putting up samples for B.O.D. determination from points on the river where the oxygen is depleted has been to dilute the samples with Formula C dilution water* to obtain a sufficient quantity of dissolved oxygen for incubation regardless of the biochemical oxygen demand of the sample. This practice resulted in relatively low oxygen depletions on some of the samples. It was recommended that such samples be re-oxygenated by atmospheric reaeration rather than by dilution. This can be easily accomplished by introducing the sample upon

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* Theriault, E. J., McNamee, P. D., and Butterfield, C. T., Experimental Studies of Natural Purification in Polluted Waters. V. Selection of Dilution Water for Use in Oxygen Demand Tests. Public Health Reports 46, 1084-116 (1931) Reprint No. 1475.

which the B.O.D. is to be determined into a 2 liter bottle, bringing the water to about 20°C. and shaking vigorously for several minutes. The sample is then siphoned into two D.O. bottles, the initial dissolved oxygen is determined upon one and the other is incubated at 20°C.

Another practice employed which is inadvisable is to incubate samples for B.O.D. which are supersaturated with oxygen at 20°C. when put into the incubator. When the field dissolved oxygen determination indicates that the sample is supersaturated with oxygen at 20°C. the excess oxygen should be removed before incubation. This can be accomplished by putting the sample into a large flask or bottle and raising the temperature to from 25 to 28°C. and shaking vigorously for several minutes. The sample is then cooled to 20°C., siphoned into two D.O. bottles, one of which is used to determine the initial dissolved oxygen and the other incubated.

As certain difficulties were indicated with the dissolved oxygen determination, the exact procedures to be used in determining dissolved oxygen by the azide modification and by the alkaline hypochlorite method were gone over in the laboratory. Because of the presence of hydrogen sulphide in the water under the ice it was suggested that the alkaline hypochlorite modification be tried in determining the dissolved oxygen in such samples.

During the afternoon meeting the possibility was discussed of completing arrangements whereby the Manitoba representatives would have some samples collected from points on the River in Manitoba weekly or thereabouts and have them delivered to Pemberton, N. D. These samples would be picked up by North Dakota men on the day they were collected and brought into the laboratory at Grand Forks for analyses. If this plan is worked out successfully, a start will have been made in the study of the pollution of the Red River of the North on both sides of the international border.

Respectfully submitted,

C. C. Ruchhoft

C. C. Ruchhoft,
Principal Chemist

February 13, 1939.

PHOTOGRAPHS AT RED RIVER POLLUTION SURVEY CONFERENCE

1. Group on coulee at Grand Forks, N. D., where low temperature B.O.D. experiments on Red River samples are being conducted.

2. Chopping through ice to get samples suspended underneath.

3. B.O.D. samples being pulled up from under the ice.

4. Low temperature B.O.D. samples ready to be taken to laboratory for examination.